

# LINEAR REGRESSION EXERCISE

(METHOD OF "LEAST SQUARES")

ALGEBRA  
Per4 - CANTON

NAME

GIVEN A TABLE OF X-Y ORDERED PAIRS THAT ARE EXPECTED TO BE RELATED BY A LINEAR FUNCTION, USE THE METHOD OF "LEAST SQUARES" TO FIND THE "BEST FIT" EQUATION OF THE LINE IN  $*Y = MX + b$  form. (FOLLOWS THE EXAMPLE WORKSHEET) P242

GIVEN:

	X	Y	X <sup>2</sup>	XY
N = <input style="width: 30px; height: 20px;" type="text"/> COUNT NUMBER OF X-Y PAIRS	1	5	<input style="width: 60px; height: 20px;" type="text"/>	<input style="width: 60px; height: 20px;" type="text"/>
	2	8	<input style="width: 60px; height: 20px;" type="text"/>	<input style="width: 60px; height: 20px;" type="text"/>
	3	11	<input style="width: 60px; height: 20px;" type="text"/>	<input style="width: 60px; height: 20px;" type="text"/>
	4	11	<input style="width: 60px; height: 20px;" type="text"/>	<input style="width: 60px; height: 20px;" type="text"/>
	5	14	<input style="width: 60px; height: 20px;" type="text"/>	<input style="width: 60px; height: 20px;" type="text"/>
	6	16	<input style="width: 60px; height: 20px;" type="text"/>	<input style="width: 60px; height: 20px;" type="text"/>
COLUMN SUMS	<input style="width: 60px; height: 20px;" type="text"/>	<input style="width: 60px; height: 20px;" type="text"/>	<input style="width: 60px; height: 20px;" type="text"/>	<input style="width: 60px; height: 20px;" type="text"/>
	COL 1	COL 2	COL 3	COL 4
COLUMN MEANS	<input style="width: 60px; height: 20px;" type="text"/>	<input style="width: 60px; height: 20px;" type="text"/>		
	COL 1	COL 2		

\*  $Y = aX + b$

$\uparrow$                        $\uparrow$   
 SLOPE                  Y INTERCEPT

STEP 1 & STEP 2 FILL IN THE MISSING VALUES IN THE ABOVE TABLE

STEP 3 SUBSTITUTE THE VALUES FROM THE ABOVE TABLE INTO THE FORMULA FOR SLOPE = a

$$\text{SLOPE} = a = \frac{\text{Sum of COL 4}}{\text{Sum of COL 1} - \left[ \frac{\text{Sum of COL 2} \cdot \text{Sum of COL 2}}{N} \right]}$$

$$\frac{\text{Sum of COL 3}}{\text{Sum of COL 1} - \frac{\text{Sum of COL 1}^2}{N}}$$

TIP  
DON'T FORGET TO SQUARE NUMERATOR

SLOPE = a =

FINALLY, SUBSTITUTE THE VALUES FROM THE ABOVE TABLE INTO THE FORMULA FOR "b"

$$\text{YINTERCEPT} = b = \text{MEAN OF COL 2} - \left[ \text{SLOPE} = a \cdot \text{MEAN OF COL 1} \right]$$

b =

$\therefore Y = aX + b$        $Y = \text{} X + \text{}$        $\leftarrow$  ANSWER